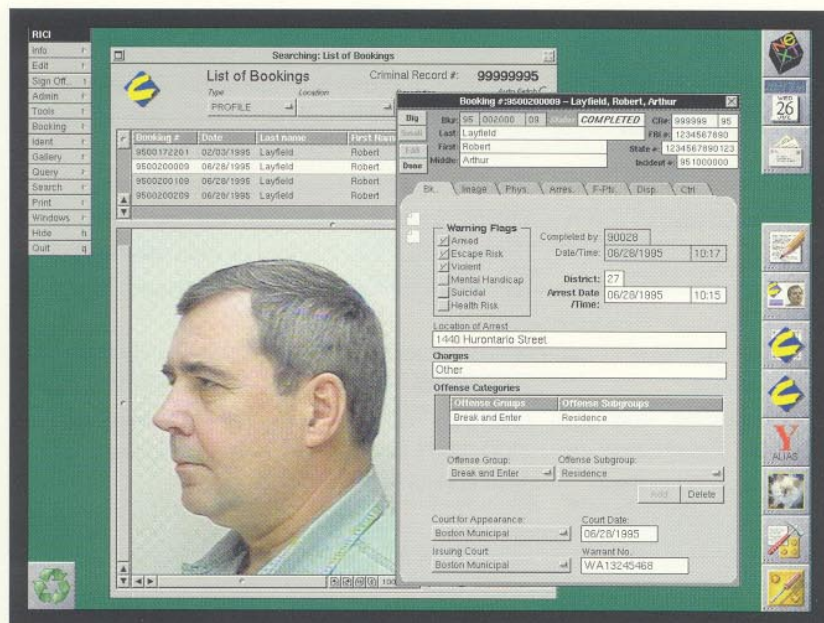


The Boston Police Department

Booking Crooks with Objects

*NeXT and Comnetix
redefine law enforcement
information management—
and earn certification by
the FBI.*

When technology allows an established standard to be redefined, delivering a far-reaching, tangible benefit, people take note. That's the result Comnetix, a NeXT developer and systems integrator has achieved with its revolutionary ID Imaging System, Repository for Computer Integrated Imaging, or RICI, a complex law enforcement application for the Boston Police Department.



"The 'technology' that law enforcement professionals use to collect information on criminals has changed only slightly since the turn of the century," explains Robert Layfield, Manager of Police Systems for Comnetix. "Fingerprints are collected on paper; mugshots on film. Archiving this information means storing a lot of paper in decentralized, unconnected physical files. We knew we could redefine law enforcement information and ID management with technology. NeXT gave us a way."

Urban Reality

Layfield cites the Boston Police Department as the first department in North America to install a fully FBI-certified ID imaging system. "Boston averages 40,000 arrests a year," Layfield says. "They need to fingerprint, photograph, and look for prior records for each of these prisoners."

In the past, Boston officers transported offenders to a centralized facility where they would get prints, take photographs, and begin the 45-day process of manually tracking their records. Annual costs: hundreds of thousands of taxpayer dollars—with limited results. The constraints associated with a manual recordkeeping environment let Boston identify only felony suspects. And, to cut costs, the Department released some minor offenders without identifying them. It had no choice. Comnetix proposed a system that would deliver a vastly higher hit-rate on prisoner IDs, at a vastly lower price. Comnetix and NEXTSTEP/OpenStep delivered the solution.

Reliable, Safe, Fast

Comnetix worked closely with Boston and the FBI—which recently established standards for ID data collection and transmission—to develop a comprehensive, automated police identification management system based on NEXTSTEP/OpenStep. The result: a redefinition of the entire criminal ID metaphor.

"RICI revolutionized the collection and archiving of prisoner information," said Layfield. "It's the first system in the nation to meet the new FBI standards for ID imaging and the first to electronically transmit ID information directly to the FBI. And NeXT software facilitates our customization for the other police departments we serve."

Boston Police anticipates savings of more than \$1 million per year due to the elimination of prisoner transport and reduced officer workload. The solution has resulted in the following:

- allowed district officers to focus on issues in their neighborhoods rather than on criminal transport
- cut data tracking time from weeks to hours
- reduced risk to the department's most important resource: the officers themselves
- able to identify prisoners while still in custody



Flexible, Strong

"NEXTSTEP/OpenStep's flexibility is unparalleled," explains Greg Galvin, Technical Project Leader. "Our prototyping was stronger, our development faster, and our user interface cleaner than we could have achieved in any other environment."

"Each year, at least 65,000 serious offenders are re-arrested in the U.S. for minor crimes and released because the policing community couldn't get to their previous records in time—because in the manual system they had to wait until the prints reached the FBI by mail to get the information back. Imagine the benefits society reaps if we can get what we need to know while the prisoners are still in custody. NEXTSTEP has the framework to make that vision a reality."—Robert Layfield, Manager of Police Systems, Comnetix

"NEXTSTEP lets us automate the entire working process, from taking a fingerprint to storing information to querying against physical data," Greg Galvin says. The Boston Police system, based on DEC hardware running ORACLE7, uses cutting-edge data collection and compression technologies at 10 booking sites around Boston. Data captured at these sites is stored at a central identification server and accessible at dozens of investigator workstations in police offices throughout the city. Each network component supports the TCP/IP protocol and is connected via LANs and a frame relay WAN.

Galvin's six-person development team built the application using NEXTSTEP/OpenStep because it offered the most cost-effective engine for this highly complex application. "NEXTSTEP/OpenStep let us isolate the various functions of the application into modules," he explains, "and that helped us localize changes, leverage object development, and take advantage of NeXT's superior debugging environment. Designing in any other OS would have taken longer and impacted critical design decisions."

Galvin and his team quote object reuse of up to 70 to 80 percent in the development of this and subsequent applications, a savings that allowed ID Imaging to be delivered on time and on budget. "Object reuse helped us speed development time and reduce project costs that would otherwise have been prohibitive."

Prototyping On The Fly

The development team prototyped the ID Imaging application in one month, gaining constant feedback from users in Boston to ensure satisfaction with the final product. "Other tools would have taken two to three times as long," Galvin reports. "NeXT's Interface Builder™ let us present our ideas with WYSIWYG certainty, collaborate with users, and hasten refinements. It helped us welcome, rather than fear, the iterative development process."

Galvin calls Interface Builder "unequivocally the best tool that I have ever seen. I can easily design new forms, reports, screens, and walk through them with users. It just doesn't work like that in any other environment."

Simplifying A Network

"What's amazing about this system is that there's almost no downtime," Layfield reports. "A department can't hold prisoners forever while they're fixing the system."

"NeXT's tools let us build an iron-clad system—one that's almost impervious to network and server failure. Boston can keep on processing prisoners and capturing fingerprints even if their main server is down. A server crash would have dire consequences in any other software environment."

Dave Aspinall, Systems Administrator on the project, credits NetInfo®, NeXT's distributed network administration solution, for the system's reliability. "NetInfo let us graphically design a complex WAN with minimal hardware and maximum reliability," he

says. "Even if we could have built this network with other technologies, we would have needed dedicated hardware for managing network intelligence. NEXTSTEP/OpenStep let us store all of our protocols right alongside the network's information. That saves the expense of an additional server."



NetInfo also let Comnetix get the ID Imaging network up and running with record speed. "Workstations attach to the network in minutes rather than the days most systems require," Aspinall says. "NetInfo's graphic tools let us 'snap' new users on quickly and easily, even upgrade software, right over the phone. This is unheard of in other environments."

"And, since NetInfo ships with NEXTSTEP/OpenStep, we're working with tools that come from a single source. That means no incompatibilities or finger-pointing among multiple vendors."

Remote Control

NetInfo also facilitates systems administration and maintenance, dramatically reducing the dependency on technical staff to manage network components. "NetInfo gives us the power to take care of Boston's system across phone lines," Layfield explains. "That means Boston didn't have to hire staff to support this highly complex network."

Arrest Booking Form.

 Boston Police Department Arrest Booking Form		Report Date: 05 / 18 / 1995 Booking Status: COMPLETED Printed By: Aspinall, David	
		District: 7 Cell Number: 12 Charges: A+B DW to wit baseball bat	
Warrant: 95CR12345 Court: Roxbury			
Master Name: Layfield, Robert Location Of Arrest: 200 Stuart Street			
Booking Name: Perrow, Graeme Alias: Escubedo, Edward Address: 200 Stuart Street, Boston, MA			
Booking Number: 95-123456-07 Incident Number: 95-1234567 CR Number: 123456-95 Booking Date: 05/16/95 18:00 Arrest Date: 05/16/95 17:20 RA Number:			
Sex: Male Height: 5' 8" Occupation: Salesman Race: White Non Hispanic Weight: 175 lbs Employer / School: Date Of Birth: 09/09/1909 Build: Medium Emp/School Address: Place Of Birth: Toronto, Ontario Eye Color: Blue Social Sec. Number: 123-12-1234 Marital Status: Single Hair Color: Black Operators License: 123-12-1234 Complexion: Fair State:			
Phone Used: NO Scars / Marks /: Tattoo Right Arm: Dragon Examined at Hospital: YES Tattoos: Scar Neck: Breathalyzer Used: NO Clothing Desc:			
Cautions: VIOLENT SUICIDAL		Booking Comments: prisoner became violent during booking	
Visible Injuries: cut finger, right hand, prior to arrest			
Arresting Officer: BPD 12345 David Aspinall Partner ID: BPD 22222 Unit: A103D Booking Officer: BPD 12345 David Aspinall Transporting Unit: A103D Informed Of Rights: BPD 12345 David Aspinall Placed In Cell By: BPD 12345 David Aspinall Searched By: BPD 12345 David Aspinall			
JUVENILE INFORMATION			
Person Notified: Smith, Joe Relationship: Father Phone: 617-482-1800 Address: 200 Stuart Street, Boston, MA Juv. Prob. Officer: Smith, Joe Notified By: BPD 12345 David Aspinall Notified Date / Time: 05/16/95 18:05			
Ball Set By: I Selected the Ball Comm. Bailed By: Signature Of Prisoner Amount:			
BOP Check: Signature of Duty Supervisor Suicide Check: BOP Warrant: BOP Court:			



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It also means that Comnetix' support resources are scalable, becoming increasingly cost-effective as new users come up to speed. "Wherever users call from, we can fix things on the spot," continues Layfield. "System support, even upgrades—they're a phone call away. Users don't have to hire staff, wait for support, or fly experts out to fix things. The health of our system and our ability to keep it strong are a direct result of NeXT's network management."

Built For Growth

Boston's solution was the first to be acknowledged by the FBI as fully compliant with the Bureau's new certification standards. And that's just the beginning. ID Imaging has received accolades from across the continent and around the world. "More than 50 agencies have reviewed the system," Layfield says, "and everyone wants to join in."

Working in tandem with the Boston Police and the FBI, Comnetix' interaction ensures ongoing compatibility with the cutting-edge protocols for ID data collection and transmission. That means that all interested areas—including a number of large metropolitan police departments in the U.S., Canada, and Europe—will join in redefining a standard of information management that's been unchanged for decades. And NeXT tools will support the rapid growth that Layfield foresees.

Date Started	Date Deployed
May 1994	February 1995
Development Team	Users
6 members	300-400
Number of Classes	Percent of Reuse
300	70 to 80%
NeXT Tools	
NEXTSTEP Developer	
Hardware Architecture	
DEC 486 or Pentium PCs, Alpha 2100 DEC servers	

"We built our solution to scale as new sites and new applications come up to speed," Layfield concludes, quoting plans for a wide-area information-sharing strategy with Boston Police acting as the lead, as well as a new personnel imaging system that can identify and track all Boston city employees. "Historically, police departments have acted autonomously. But criminals don't respect geographical boundaries. NEXTSTEP/OpenStep makes it easy to bring other users into our system. This is the first system that invites agencies to work together."



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